

Trends towards minimally invasive techniques: epidemiology and surgical management of craniosynostosis in Germany over 7 years [Abstract]

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are required to confirm these predictors and refine surgical protocols.

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Session 122: Neurosurgical early-life interventions, October 4, 2026, 8:00 AM - 9:30 AM

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Neuroendoscopic Lavage Efficacy in Gram-Negative Cerebral Ventriculitis in Pediatrics: A Prospective Controlled Study

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Gram-negative bacterial ventriculitis is a severe type of ventriculitis with more than 60 percent mortality. Neuroendoscopic Lavage (NEL) is an emerging technique for managing cerebral ventriculitis. We aim to compare the efficacy of NEL, to the standard conventional management in patients with gram-negative cerebral ventriculitis.

Methods: A prospective, controlled, randomized study was conducted. Gram-negative infections with a Cerebrospinal Fluid (CSF) Total Leucocytic Count (TLC) >100 were enrolled. Patients were allocated to one of two management groups randomly: the NEL group or the conventional management group. Primary outcome is mortality rate and secondary outcome is morbidity measured by mRS scores.

Results: Thirty-one patients met our inclusion criteria. The mean age of the study population was 53.06 ± 68.14 months for the conventional group and 62.79 ± 72.08 months for the lavage group. The mortality rate was 4/14 (28.6%) in the lavage group and 9/17 (52.9%) in the conventional group. Good mRS scores were achieved in 6/14 (42.9 %) of the lavage group and in 4/17 (23.5 %) of the conventional group.

Conclusions: NEL with antibiotics might be useful in the management of gram-negative cerebral ventriculitis in pediatrics and could be associated with a better outcome and a decreased mortality rate compared to current conventional lines of treatment.

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Trends Towards Minimally Invasive Techniques: Epidemiology and Surgical Management of Craniosynostosis in Germany over 7 years

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Craniosynostosis remains a central entity in pediatric neurosurgery, with increasing implementation of minimally invasive surgery. This study analyzes nationwide trends in Germany over a seven-year period.

Methods: Nationwide in-hospital case data from 2019 to 2025 were extracted from the InEK-database. Cases were identified using ICD-10-code Q75.0. Surgical interventions were categorized according to OPS-coding as either operative or exclusively endoscopic. Descriptive longitudinal analyses were performed to assess annual cases, gender distribution, operative rates and patient clinical complexity level (PCCL) categories.

Results: Over the seven-year study period, a total of 4,987 in-hospital cases of craniosynostosis were recorded nationwide. Annual case numbers remained relatively stable, ranging from 690-790 per year. A consistent male predominance was observed (males around 66%, females 34%), without significant temporal variation.

The overall surgical rate remained stable at around two-thirds of all cases (62–69%). In contrast, a marked structural shift was observed in operative technique. The proportion of endoscopic procedures among all surgeries increased steadily from approximately 12% in 2019 to nearly 29% in 2025, representing more than a twofold increase over seven years. All endoscopically treated cases fell within the first year of life.

Regarding clinical complexity, the majority of patients consistently fell into low PCCL categories across all years, with PCCL 0 representing approximately 60–70% of cases annually. Endoscopic procedures resulted in low-PCCL (>90%), compared with ~70% in open surgery (Chi-square test, $p < 0.001$).

Conclusions: This seven-year nationwide analysis shows that while overall case numbers and surgical rates for craniosynostosis in Germany remained stable, the use of endoscopic techniques more than doubled, indicating a structural shift toward minimally invasive management. Endoscopic procedures were almost exclusively performed within the first year of life and resulted in lower clinical complexity. Our data suggests that the observed increase in endoscopic surgery represents a structural change in operative strategy rather than an epidemiological trend.

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Session 123: Practical management and everyday challenges in neuro-oncology, October 4, 2026, 9:30 AM - 10:30 AM

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Tumor Volume Independent Diagnostic And Prognostic Plasma Biomarker Candidates For Gliomas

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Gliomas, particularly glioblastoma (GBM), are associated with poor survival and require invasive tissue sampling for diagnosis, treatment stratification, and surveillance. Blood-based liquid biopsy approaches could offer a safer, more accessible alternative, yet clinically validated plasma biomarkers are lacking.

Methods: We performed unbiased high-throughput LC-MS plasma proteomics in a discovery cohort of 103 glioma patients and 57 healthy controls, with external validation in 36 patients and 24 controls. Differential expression analysis, unsupervised clustering, and machine learning were used to derive diagnostic and prognostic signatures. Overall survival (OS) and time-to-relapse (TTR) were evaluated using Cox regression. In 43 patients, tumor, edema, and whole-lesion volumes were quantified and correlated with plasma biomarkers.

Results: Proteomic profiling identified reproducible glioma-associated plasma signatures across cohorts, including dysregulated proteins such as HBB, PRDX2, SLC4A1, APOC4, and platelet/cytoskeleton-related markers. Machine learning models accurately distinguished glioma patients, including grade 4, from controls (accuracy 0.84/0.83 in discovery and 0.98/0.96 in validation cohorts). Unsupervised clustering revealed two conserved plasma proteomic subtypes; cluster 1 showed signatures of aggressive, invasive, and immune-interactive biology. Although cluster-specific differences in OS and TTR were not statistically significant, trends suggested poorer outcomes in cluster 1. Multivariate Cox models identified LTF, CEL, and COPB2 as predictors of OS, and CD14, FTO, and JUP as candidates associated with shorter TTR. Importantly, plasma biomarker levels did not correlate with tumor or edema volume, indicating volume-independent biomarker potential.

Conclusions: Plasma LC-MS proteomics enables accurate, minimally invasive detection of gliomas, identified conserved molecular subtypes, and yields prognostic biomarker candidates independent of tumor burden. These findings support plasma proteomics as a promising tool for glioma diagnosis, risk stratification, and longitudinal monitoring, warranting validation in larger prospective studies.

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